

REMARKS

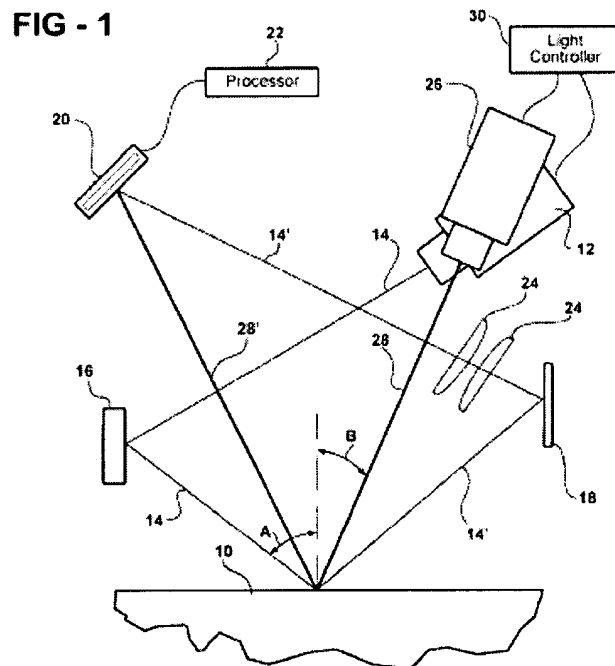
Reconsideration of this application and the rejection of claims 1-4, 6, 7 and 9-32 are respectfully requested. Applicant has attempted to address every objection and ground for rejection in the Office Action dated January 30, 2008 (Paper No. 20080124) and believes the application is now in condition for allowance. The claims have been amended to more clearly describe the present invention.

Claims 1, 9, 13-18 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,509,964 to Wiles et al. Wiles discloses a multi-beam apparatus for measuring surface quality including a first light source 12a directing focused beams of light 14 onto a surface of a workpiece 10, and a second light source 26 configured for providing a beam of collimated, unfocused light. Specifically, first light source 12 has a plurality of separate light emitters which each operate to generate a separate beam of focused light which is impinged on the workpiece. (Col. 3, lines 56-61).

Wiles does not disclose the elements recited in amended claim 1. Specifically, amended claim 1 now recites, among other things, a device for measuring the properties of high-gloss finishes of vehicle bodies including “at least one first radiation means having at least one first radiation source which directs substantially collimated radiation at a predetermined angle towards a measurement surface,” “a plurality of second radiation means each having at least

one second radiation source, each of which projects non-collimated radiation onto the measurement surface...said plurality of second radiation means are spatially distributed to achieve a uniformly non-collimated radiation onto said measurement surface” and “at least one radiation detector means which captures at least a portion of the radiation reflected and/or diffused off the measurement surface.”

Wiles fails to disclose a plurality of second radiation means that each have at least one second radiation source and that projects non-collimated radiation onto the measurement surface.



Instead, as shown in Fig. 1 above, Wiles discloses a first light source 12 and a single, second light source 26. Wiles therefore does not disclose “a plurality of second radiation means” as recited in amended claim 1.

Furthermore, Wiles discloses that the unfocused beam 28 emitted from the second light source 26 is a “collimated beam” (Col. 4, lines 42-45). In contrast, amended claim 1 recites that the plurality of second radiation means are spatially distributed to achieve a uniformly “non-collimated” radiation onto said measurement surface.

Using collimated beams or collimated radiation as disclosed by Wiles is disadvantageous as recited in page 1, paragraphs 3 and 4 of Applicant’s application. A primary drawback of the measuring devices in the prior art are that the devices (such as those in Wiles) use collimated or parallel light for determining reflection or diffusion characteristics of an examined surface. These devices generally are capable of simulating the reflection characteristics of a finished car body on cloudless, sunny days because the sunlight is generally collimated or parallel light. However, on overcast or non-sunny days, light will reflect off of the body surface from a plurality of directions and will be scattered by the clouds, resulting in uncollimated or diffused light. Thus, the impression of the surface to the human eye is determined by whether the surface is illuminated by collimated and/or uncollimated light.

In this regard, Wiles discloses using only collimated radiation or light for detecting the surface. In contrast, claim 1 recites both collimated and non-collimated light to detect the surface characteristics. Wiles does not disclose or suggest providing non-collimated radiation. Furthermore, Wiles does not

disclose or suggest combining different types of radiation that provides collimating and non-collimating radiation in a single measuring device.

Further, Wiles also does not disclose or suggest detecting incident radiation dependent on a wavelength of the radiation. Detecting wavelengths of the reflector of diffused radiation is necessary for separating the collimated and non-collimated portions detected usually at the same time by one detector as recited in claim 1. In contrast, Wiles teaches multiplexing by a light controller 30 that sequentially energizes each of the light emitters in the light sources (first and second) so that a series of beams, separated by time, are produced. A detector 20 receives these time-separated beams and generates time-separated signals, which are conveyed to a processor 22. The source controller 30 and the processor 22 communicate so that the processor can identify which beam is being detected at any particular time (Col. 4, line 67 to Col. 5, line 12). As a result, detection depending on the wavelengths of the detected radiation is not necessary in Wiles.

For at least these reasons, Applicant submits that amended claim 1, and the claims that depend therefrom, are each patentably distinguished over Wiles and in condition for allowance.

Claims 2-4, 6, 7, 10-12, 20, 21, and 25-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wiles in view of U.S. Patent No. 6,822,734 to Eidelman et al. Applicant disagrees with and traverses this rejection for the following reasons.

As stated above, Wiles does not disclose or suggest a device that includes a plurality of second radiation sources that project non-collimated radiation onto a measurement surface. Eidelman does not remedy the deficiencies of Wiles.

Eidelman discloses an apparatus and method for manufacturing and inspecting flatwork pieces such as flat panel display screens (FPDs). As shown in FIG. 3, an array (70, 72, 74) of illumination units 60 are used inside an enclosure 40 to provide various selectable combinations of illumination onto the screens. Each of the illumination units 60 has a diffuser element 68. (Fig. 4). Thus, the illumination units 60 emit diffused or non-collimated light or radiation onto the screens. Eidelman therefore does not disclose or suggest at least one first radiation means having at least one first radiation source which directs substantially collimated radiation at a predetermined angle on a measurement surface as first cited in amended claim 1.

In another embodiment shown in Fig. 11, Eidelman discloses a plurality of illuminators 160 that have a reflector 162 to direct illumination onto a substrate 150 (Col. 26, lines 31-35). The reflector 162 reflects or diffuses the generated to cause it to be non-collimated.

Furthermore in a third embodiment shown in Figs. 12 and 13, Eidelman utilizes reflectors 322 that each have a focus point (such as reference

number 326 in FIG. 15). The radiation directed to the focus points is not parallel and therefore non-collimated.

For all of these reasons, Applicant submits that amended claim 1, and the claims that depend therefrom, are each patentably distinguished over the combination of Wiles and Eidelman and in condition for allowance.

Claims 19, 23 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over a combination of Wiles, Eidelman and in further view of U.S. Patent No. 6,542,248 to Schwarz. Claims 19, 23 and 24 depend from amended claim 1 and therefore Applicant submits that these claims are patentably distinguished over the combination of Wiles, Eidelman and Schwarz for at least the reasons provided above with respect to amended claim 1.

Furthermore, Schwarz discloses a device and method for determining the quality of structured surfaces that includes a first optical device that emits light at a measurement surface and a photo sensor that receives the light after it is reflected off the measurement surface. Schwarz does not disclose or suggest a first radiation source or any source that directs substantially “collimated” radiation at a measurement surface. Furthermore, Schwarz does not disclose or suggest combining different types of light sources, such as a first radiation means and a plurality of second radiation means that radiate both collimated and non-collimated light.

For at least these reasons, Applicant submits that claims 19, 23 and 24 are each patentably distinguished over the combination of Wiles, Eidelman and Schwarz and in condition for allowance.

New claim 33 is directed to a device for measuring the properties of high-gloss or metallic finishes of vehicle bodies, including a housing positioned above a measurement surface, at least one first radiation means positioned in the housing and having at least one first radiation source which directs substantially collimated radiation at a predetermined angle towards a measurement surface, a plurality of second radiation means positioned in the housing and having at least one second radiation source, each of which projects substantially non-collimated radiation onto the measurement surface, where the second radiation means are equally distributed on a geometrical spherical surface or a geometrical surface of a rotational ellipsoid, at least one radiation detector means which captures at least a portion of the radiation reflected or diffused off the measurement surface and which emits at least one measurement signal as characteristic of the reflected radiation where the radiation detector includes a device for detecting incident radiation dependent on a wavelength of the radiation.

As stated above, none of the cited references disclose or suggest a device for measuring properties of a vehicle body that includes a first radiation means and a plurality of second radiation means or a first radiation means that

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emits collimated radiation and second radiation means that emits non-collimated radiation.


For at least these reasons, Applicant submits that new claim 33 is patentably distinguished over the cited references and in condition for allowance.

Claim 32 is objected to as being dependent upon a rejected based claim but will be allowable if rewritten in independent form. Applicant acknowledges and appreciates the allowance of claim 32. Applicant wishes to defer rewriting this claim in independent form at this time because Applicant believes that claim 32 is patentably distinguished over the cited art for reasons provided above with respect to amended claim 1.

In view of the above amendments, the application is respectfully submitted to be in allowable form. Allowance of the rejected claims is respectfully requested. Should the Examiner discover there are remaining issues which may be resolved by a telephone interview, he is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,

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